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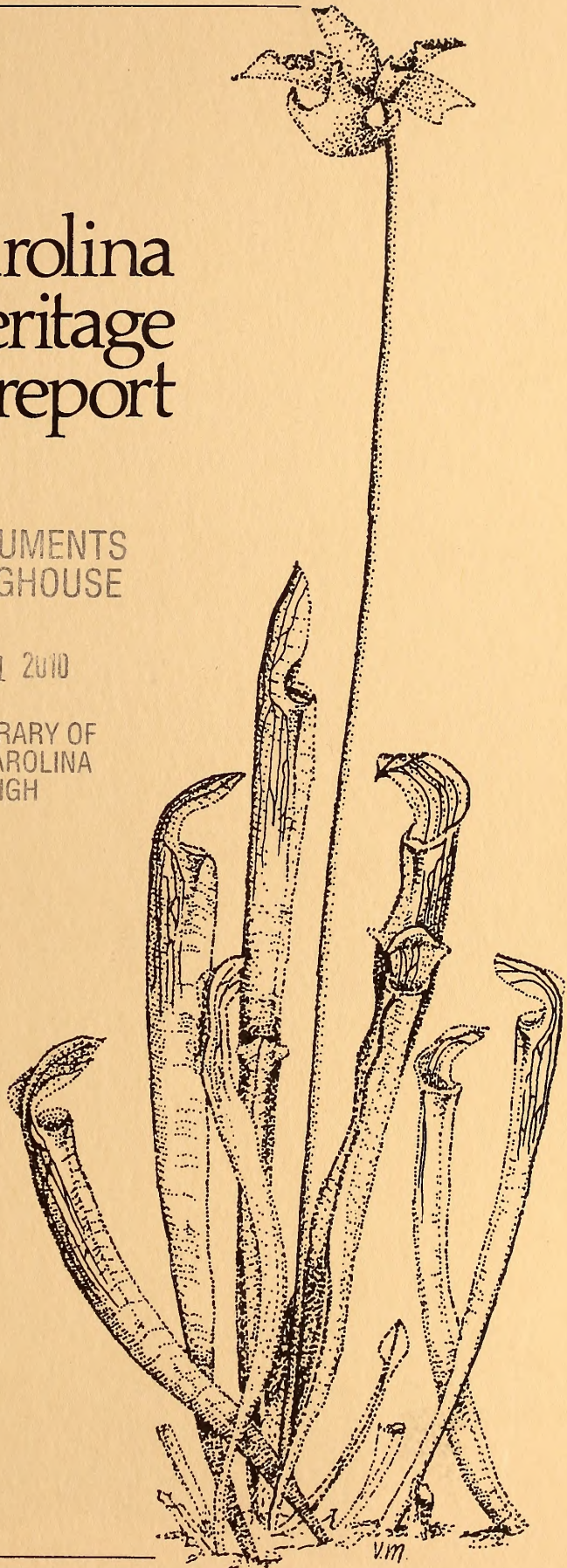
North Carolina Natural Heritage program report

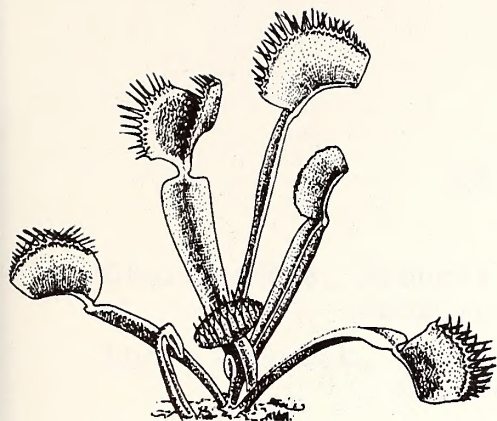
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1978





NORTH CAROLINA NATURAL HERITAGE PROGRAM

for the preservation of natural diversity

N. C. Department of Natural Resources and Community Development
Division of Parks and Recreation
Planning and Research Section
P. O. Box 27687
Raleigh, N. C. 27611

ANNUAL REPORT

October 1, 1977 - October 31, 1978



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Acknowledgment: This program has been primarily supported by a grant from the Coastal Plains Regional Commission, US Department of Commerce. The program has also received support from the NC Wildlife Resources Commission's Endangered Species Program and the Heritage Conservation and Recreation Service, Department of the Interior.

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NORTH CAROLINA'S NATURAL HERITAGE PROGRAM

North Carolina is endowed with a magnificent natural heritage, one of the richest in America. Yet each year more of the natural landscape is destroyed and native wildlife is more imperiled. Fortunately there remain a number of unspoiled natural areas that maintain a rich natural diversity. The preservation of these natural areas is critical for their scientific, recreational, educational, cultural, and aesthetic benefits. The protection of our natural heritage, of which North Carolinians are so proud, is a principal objective of this state's balanced growth policy.

The protection of our natural heritage has long been a cooperative effort of government, conservation organizations, and private citizens. Building on this tradition, the Department of Natural Resources and Community Development in 1976 established the Natural Heritage Program, with the assistance of The Nature Conservancy, to comprehensively identify the outstanding natural areas of our state and plan for their protection. This program, administered by the Division of Parks and Recreation, is intended to provide the information necessary to determine which parts of the natural landscape most merit protection and to develop and implement means for their preservation and management. The Natural Heritage Program operates in association with the state parks natural areas program. The Natural Heritage Program cooperates closely with all resource divisions of DNRCD, the Wildlife Resources Commission, State Museum of Natural History, state universities, federal land management agencies, local government, The Nature Conservancy, and the private sector. Establishment of a permanently protected system of nature preserves is a major goal, with emphasis on designation of natural areas on public lands. The Natural Heritage Program also seeks to provide incentives to encourage private landowners to protect prime natural areas.

PURPOSE OF THE NATURAL HERITAGE PROGRAM

Principal objectives of the Natural Heritage Program are to:

1. Identify through a systematic inventory the special elements of natural diversity and natural areas which best exemplify North Carolina's natural heritage.
2. Provide inventory information to decision-makers for use in development planning, environmental impact assessment, and resource management decisions.
3. Establish for present and future generations a statewide system of protected natural areas.
4. Develop strategies for active citizen and landowner participation in preserving North Carolina's natural heritage and promote public awareness and appreciation of our natural environment.

ACCOMPLISHMENTS OF 1977-78

The Natural Heritage Program in its second year has clearly demonstrated its effectiveness and importance for conservation planning. The emphasis this year has been upon the development of the inventory system and protection strategies. The emphasis in the year ahead will be on the designation of important natural areas and implementation of protection strategies. Major accomplishments of the program during the October 1977 - October 1978 period are summarized in the following sections.

I. NATURAL DIVERSITY INVENTORY

A. Inventory of Natural Elements

A rational decision process must determine which parts of the natural landscape and which native species most merit protection. The pilot inventory focuses on the most critical components (or elements) of our natural diversity -- habitats of endangered and rare species (those species listed by the 1975-1977 State Museum of Natural History sponsored symposium), outstanding examples of plant communities and ecosystems (using the classification system developed largely by Dr. A.E. Radford, UNC-CH), exemplary or unique geologic features, and special wildlife habitats. Occurrence information (including location, ownership, management, protection status, rarity, site description-quality-viability, source and date of information, etc.) is assembled for each of these natural elements.

To this date 4,916 occurrence records of special natural elements have been collected in the NHP pilot inventory. Approximately 1,000 of these element records were assembled since the summer of 1977. A detailed explanation of the inventory system was contained in the Natural Heritage Program's 1977 report.

This information is recorded in the program's data management system -- topographic maps, geographic and element files, computer storage and retrieval system. The inventory is supplemented by resource (bibliographic catalog) and managed area files. Inventory information is assembled from a variety of sources including museum and herbaria collections, resource surveys, scientific literature, planning studies, scientists and students, resource managers and specialists, professionals and amateur naturalists.

The Natural Heritage staff analyze the pilot inventory data base to identify gaps in the information, so that subsequent inventory efforts can be concentrated on data voids and weaknesses. Extensive

(reconnaissance) field surveys by Natural Heritage staff and others verify and clarify element occurrence reports. Intensive (basic or ecosystematic) field inventories provide more detailed information, particularly important for sites of great ecological significance and for use in protection and management planning.

NHP staff have conducted reconnaissance surveys of natural areas including: Waccamaw River, Green Swamp, Bird Island, Bald Head Island, Carolina Beach, Pender County limesinks, Holly Shelter, Sloop Point, Topsail Island, Bladen Lakes, various other Carolina Bays, Black River, Cumberland County sites, various Sandhills sites, Lake Ellis Simon, White Oak River, various sites in Croatan National Forest, Jones Island, Nags Head Woods, Milltail Creek, various Roanoke River areas, Great Swamp, Medoc "Mountain," Franklin County outcrops, Catsburg area, Monkey Island, Chocowinity and Chicod Creeks, Boyd Estate, and numerous state parks and nature preserves.

Extensive and intensive (basic) inventories of natural areas in the coastal region were accomplished through contract agreements with biologists from the University of North Carolina at Chapel Hill (Radford), North Carolina State University (Carter and Fuller), East Carolina University (Bellis), Old Dominion University (Musselman), and the State Museum of Natural History at Beaufort (Wilson). Additional inventory information was voluntarily provided to or collected by the Natural Heritage Program from many sources.

A network of local contacts has been established and is described in a following section. These natural scientists and naturalists assist the NHP with inventories of natural areas, verification of occurrence reports, liaison with local communities, and advice on protection strategies and approaches to landowners.

Integration of the NHP computer program with the Department's Land Resources Information Service interactive graphics system enables the production of computer-generated distribution maps for natural element records.

Inventory information is regularly provided to others for a wide variety of planning uses, as described below. In this way, the NHP inventory contributes to conservation of natural resources through informed and well-considered decisions and avoidance of unnecessary conflicts.

The NHP inventory emphasizes the continuous refinement and analysis of relevant information. The Heritage inventory is a cyclical and cumulative process. Additional and refined information collected by an ongoing inventory will improve the ability to identify and protect natural areas.

ELEMENT OCCURRENCE TALLY

NC NHP

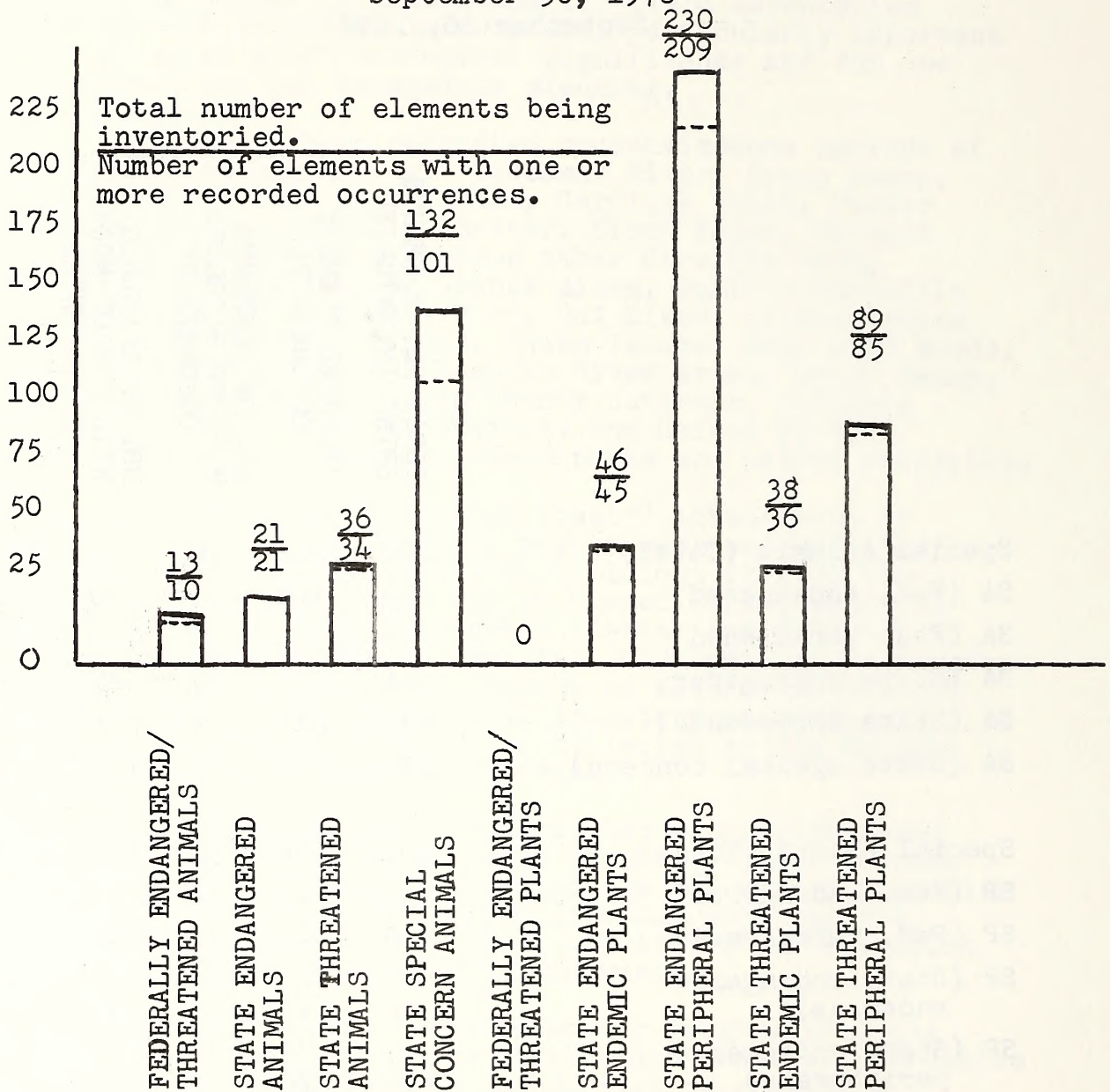
September 30, 1978

	TOTAL NO. ELEMENTS BEING INVENTORIED	REPORTED ELEMENT OCCURRENCES	NO. OF ELEMENTS WITH NO REPORTED OCCURRENCES	NO. OF ELEMENTS WITH ONE OR MORE OCCURRENCES
Special Animals (Total)	207	1271	36	171
SA (Fed. endangered)	13	318	3	10
SA (Fed. threatened)	5	35	0	5
SA (State endangered)	*21	55	0	21
SA (State threatened)	*36	226	2	34
SA (State special concern)	132	637	31	101
Special Plants (Total)	404	3408	32	429
SP (Fed. endangered)	0	--	--	--
SP (Fed. threatened)	0	--	--	--
SP (State endangered endemics)	46	242	1	45
SP (State endangered peripherals)	230	872	21	209
SP (State threatened endemics)	38	480	2	36
SP (State threatened peripherals)	89	750	4	85
Plant Communities (Total)	open ended	555	--	--
Physical Features (Total)	44	447	0	44
Aquatic Features (Total)	14		4	10
Special Wildlife Habitats	--	62	--	--

*To avoid duplication these figures do not include Federally listed endangered and threatened species which are also adopted by the State.

ANIMAL AND PLANT ELEMENTS INVENTORY

September 30, 1978



B. Endangered Species and Critical Habitat

Over 400 species of North Carolina's native plants and 72 species of animals have either become very rare or are in danger of extirpation from the state because of the loss of habitats or commercial exploitation. Some species have already been extirpated, while others are so rare or are found in such limited distribution that they could easily be extirpated through man's actions.

In 1975-77 the State Museum of Natural History sponsored symposium proceedings that developed lists of plant and animal species that are either rare or in some degree of danger of extirpation from North Carolina. A number of North Carolina species, including the bald eagle, brown pelican, peregrine falcon, red-cockaded woodpecker, alligator, Atlantic loggerhead turtle, spotfin chub, shortnose sturgeon, cougar, manatee, Indiana bat, Gray bat and noonday helix, have also been designated as endangered or threatened under the Federal Endangered Species Act of 1973.

Many of the habitats of these species in North Carolina are in public ownership, but few critical habitats have yet been designated or dedicated as nature preserves. The Natural Heritage Program has recommended the acquisition of the brown pelican's historic nesting islands by the US Fish and Wildlife Service or NC Wildlife Resources Commission under their endangered species program. Also the NHP has recommended several other wildlife habitats for inclusion in the US Fish and Wildlife Service's unique ecosystem refuge program.

The NC Wildlife Resources Commission, by section six cooperative agreement with the US Fish and Wildlife Service, is responsible for North Carolina's Endangered Species Program. The Natural Heritage Program, in turn through cooperative agreement with the NC Wildlife Resources Commission beginning in February of 1978, is collecting and recording occurrence data for federally endangered and threatened species. The NHP has solicited occurrence records from principal researchers, scientific literature, other field personnel, and resource managers. The NHP provides its data to the Wildlife Resources Commission and subcontracting researchers. Additionally, the NHP provides data on occurrences and relative rarity of species proposed for federal E/T listing, and in the A-95 and environmental assessment processes and identifies habitats which may be affected by development proposals. (See "Annual Report: WRC-NHP cooperative agreement," NC NHP, Spetember 1978).

II. NATURAL AREAS IDENTIFICATION PROCESS

The Natural Heritage Program recently completed the annual update of a priority list of natural areas deemed most important for their ecological significance. This Natural Heritage Areas List is developed through evaluation of the program's pilot and basic inventory data. As explained in detail in the 1977 program report, the Natural Heritage Program attempts to identify the species, natural features and ecosystems which are rarest, most endangered, most ecologically diverse, and least protected. These considerations -- rarity, diversity, endangerment, and protection status -- are the heart of our criteria for identifying significant natural areas and for establishing protection priorities. Following these element-based considerations, secondary factors such as site quality, viability, defensibility, and manageability come into play in determining priorities. Of lesser importance are anthropogenic considerations, including ownership, threat, availability, etc.

The evaluation and screening process that produces the priority list of North Carolina natural areas helps target the sites where more field surveys may be needed and where protection is most deserved. The Natural Heritage Areas List, while expected to expand and to be refined as more information is collected, serves to designate the state's most ecologically significant areas and to determine those areas potentially eligible for the state registry of natural areas and the proposed natural preserve system.

III. ENVIRONMENTAL REVIEW AND RESOURCE PLANNING

Information from the Natural Heritage inventory is invaluable to a wide variety of planning activities. By making its information available to planners and decision-makers, the Natural Heritage Program contributes to both sound economic development and to conservation of the natural environment.

Natural Heritage inventory information is regularly supplied to others for the purposes of development planning, environmental impact analysis, protection projects, and natural resources management. Principal examples of the utility of the Natural Heritage inventory during the course of this year have been: (a) the use of the inventory data by the US Forest Service for its RARE II potential wilderness evaluations and unit management plans; (b) use of NHP information in regional resource inventories for the Wilmington (Cape Fear, Region O), Fayetteville (Region M), and Asheville-Hendersonville (Land-of-Sky Region B) councils of local governments; (c) use of the NHP data for US Army Corps of Engineers' inventories and studies of the Atlantic Intercoastal Waterway and dredge spoil islands; (d) reliance on the NHP inventory by the US Fish and Wildlife Service for preparation of its state concept plan for the unique wildlife ecosystem program; (e) Division of Environmental Management incorporation of the NHP preliminary priority list of natural areas in the state water resources framework plan.

Public agencies and conservation organizations using Natural Heritage information this year include:

State Agencies

Wildlife Resources Commission
Coastal Resources Commission
Division of Parks and Recreation
Division of Environmental Assessment
Land Resources Information Service
State Museum of Natural History
Division of Environmental Management
Division of Marine Fisheries
Division of Marine Affairs
Department of Transportation
Department of Cultural Resources

Federal Agencies

Corps of Engineers
Fish and Wildlife Service
National Park Service
Heritage Conservation and Recreation Service
Soil Conservation Service
Forest Service
Department of Housing and Urban Development
Bureau of Land Management
Tennessee Valley Authority

Local Agencies

Areawide councils of governments
County planning departments

Private Sector

Carolina Power and Light
Duke Power
timber companies
201 facility planning and engineering firms
various private property owners

Universities

many research users

Conservation Organizations

The Nature Conservancy
National Audubon Society
NC Botanical Garden
NC Wild Flower Preservation Society
NC Land Use Congress

IV. PUBLIC INVOLVEMENT AND INFORMATION

Much effort has been devoted to introducing the Natural Heritage Program to the state's conservationists and natural scientists and to building public support for the goals of natural areas identification and protection. Along with the establishment of the NHP's network of local representatives, considerable effort has been invested in preparation of media presentations and articles, participation in workshops, conferences and organizational meetings, distribution of information, and other attention to public relations.

The NHP, in association with the North Carolina State University environmental studies program, North Carolina Academy of Science and NC Botanical Garden, co-sponsored a one-day workshop on the Natural Heritage Program. The workshop (Appendix A) attracted 120 participants from the academic community, public agencies, and conservation organizations.

Coordination has been established and maintained with other conservation agencies, organizations, and citizen groups.

A slide program about the NHP was prepared and distributed to numerous public audiences. Program brochures and informational handouts are regularly supplied to interested individuals and organizations. Information about the NHP was mailed by the NCSU Forestry Extension Service and by the US Soil Conservation Service to all their county agents. The UNC Sea Grant service has produced an interview about the NHP for its radio network program.

Magazine articles about the NHP were authored by NHP staff and published in Carolina Planning, The Nature Conservancy News, and NC Wild Flower Preservation Society (see Appendix B). Other articles about the NHP are scheduled for future publication, and articles by others about the NHP were written for the NC Wildlife Federation magazine and Society of American Foresters newsletter.

Presentations about the NHP were made at the NC Wildlife Federation Convention, Society of American Foresters annual meeting, Association of Consulting Foresters annual meeting, NC Wild Flower Preservation Society spring meeting, and Division of Parks and Recreation Advisory Council meeting. Seminars about

the NHP and natural areas identification and protection were given to the State Department of Cultural Resources' historic preservation and archeology staffs, NCSU Botany Department, UNC-Chapel Hill Botany Department, NCSU School of Design, Duke University School of Forestry and Environmental Studies, and two Coastal Resources Commission training programs for local AEC permit officers.

V. PROTECTION OF NATURAL AREAS

A. Promote Departmental Policies and Actions for Natural Areas Protection.

Culminating over a year of analyzing natural areas protection strategies in this and other states, the Natural Heritage Program has developed procedures for a proposed NC Registry of Natural Heritage Areas and has prepared legislation for the NC Natural Heritage Act of 1979. The Department registry of natural areas will recognize and honor owners of the state's outstanding natural lands, in return for voluntary pledges to protect their natural qualities. The proposed statute is designed to provide legislative sanction of the NHP inventory and planning program and the registry; it also will create a system of nature preserves by voluntary dedication or conservation easements.

Advice, information, and consultation is regularly supplied to the Division of Parks and Recreation master planners, management planner, park superintendents and naturalists. NHP staff prepared a detailed management plan for the Green Swamp preserve, which the State should eventually receive from The Nature Conservancy. NHP staff outlined management recommendations for 9,000 acres of the Bald Head Island preserve, recently received by the State. NHP staff have been engaged in master and management planning for the Hemlock Bluffs, Weymouth Woods, and Roosevelt state natural areas.

The NHP is considering a cooperative agreement with the Coastal Resources Commission to provide inventory information and protection recommendations for potential "fragile natural resources areas - Areas of Environmental Concern" in the twenty coastal counties.

B. Assist other Conservation Agencies in Developing and Implementing Protection Strategies.

The US Fish and Wildlife Service used NHP inventory information to develop its state concept plan and priorities for protecting "unique wildlife ecosystems." The FWS Regional Office used the North Carolina program as its model for all states in the Southeast. The FWS Office of Endangered Species consults NHP data for endangered and rare species.

The US Forest Service is using NHP inventory information for evaluating potential wilderness areas (RARE II study) and for district forest management plans. A pilot project to contract biological inventory and verification of NHP reported element occurrences in a national forest may become the model for other Southeastern national forests.

The National Park Service incorporated NHP data in its Cape Lookout National Seashore resource inventory.

The NHP informed the Corps of Engineers and Falls Reservoir master planners of the botanical significance of the Catsburg natural area and recommended management as a nature preserve.

The National Audubon Society used a NHP inventory of the Pine Island area of Currituck Banks in its decision to accept the 3600 acres for the first mid-Atlantic Audubon sanctuary.

The North Carolina Nature Conservancy relies on NHP information to determine its protection priorities. Since October 1977, The Nature Conservancy has helped acquire the Currituck Banks' Monkey Island and Swan Island hunting clubs, the Bald Head Island-Battery Island complex, another portion of Chowan Swamp, and the Boyd Estate longleaf pine preserve. Other TNC protection projects, including Bluff Mountain and Nags Head Woods, are underway.

The NHP helped arrange a cooperative arrangement between the North Carolina Botanical Garden and Bladen Lakes State Forest to transplant unique plants from timber harvest sites.

C. Assist Protection of Natural Areas in Private Ownership.

The proposed registry and legislation are essential for encouraging preservation of privately-owned natural areas. Informal conversations have taken place between NHP staff and several owners of key natural areas in the coastal region. The NHP is promoting current student studies on the availability of technical assistance to landowners for natural areas management.

D. Cooperate with Natural Heritage - Natural Areas Programs of other Southeastern States.

The foresight of North Carolina in establishing a strong natural areas preservation program has earned the state a reputation as a leader in this effort in the Southeast, although natural areas programs in the Midwest are further advanced. The trend is toward development of similar programs on a nationwide basis, spurred by President Carter's creation in 1978 of a national heritage program administered by the Heritage Conservation and Recreation Service in the Department of the Interior. The NC NHP is cooperating with the new national heritage program.

The NC NHP has exchanged inventory information with the heritage programs of South Carolina, Tennessee, and Tennessee Valley Authority.

NC NHP staff participated in the conference of state heritage program coordinators, in Arlington, Virginia, April 12-14, 1978; in the fifth annual Midwestern state natural areas program workshop, in St. Louis, Missouri, Southeastern natural heritage program workshop, in Norris, Tennessee, October 26-28, 1978. The NC NHP coordinator assisted in the organization of the Southeastern heritage workshop.

E. Registry of Natural Heritage Areas

This Department is currently considering the NHP proposal to establish an official state Registry of Natural Heritage Areas. If adopted in the next few months, the registry will furnish an important means for recognition and conservation of prime natural areas. The proposed registry is modeled after those recognition programs in operation by the Society of American Foresters, Heritage Conservation and Recreation Service, and numerous states. The registry will be based upon those significant natural areas derived from the NHP inventory and by nominations from others. Natural areas found eligible for registration by the Natural Heritage staff and Natural Areas Advisory Committee, will pass through a Department review process to the Department Secretary for approval. A natural area will be officially registered when a voluntary, non-binding conservation pledge is signed by the owner (private or public) and the Department. The owner will be awarded a certificate signifying the inclusion of the area on the registry. The owner will be committed to manage the designated natural area under terms of the conservation agreement and to maintain the specified natural values of the area. The agreement may be terminated by either the owner or the Department. The landowner may request management advice from the Department.

While the degree of protection afforded by such a recognition and education program is relatively low and impermanent, the protection provided by the registry must not be underestimated.

F. Proposed Natural Heritage Act

The proposed legislative package, called the NC Natural Heritage Act of 1979, is the product of over a year of study, consultation, and redrafting by NHP staff and advisors. The NHP has analyzed the techniques available to North Carolina to protect its outstanding natural areas. Defects and strengths were identified in our state's laws and policies toward natural areas protection. The conclusion was that a new law is needed to correct principal defects, to provide clear authorization, and to provide statutory clarification.

While the constitution provision known as the North Carolina Environmental Bill of Rights (Article XIV, Section 5) declares it State policy "to conserve and to protect its lands and waters," obviously not all "forests, wetlands, estuaries, beaches, historic sites, open lands, and places of beauty" can be preserved. A rational process must be developed to provide meaningful guidance as to which parts of "the common heritage of this State" are to be preserved. This proposed statute, when passed under authority of Article XIV, Section 5, would clearly make protection of natural diversity a principal goal.

The State Nature and Historic Preserve Act of 1973 is seriously defective. The cumbersome dedication process requires a joint resolution of two-thirds of the General Assembly to designate a preserve and the protection conferred is ambiguous. The 1973 act defined no operating agency, assigned no duties, provided no criteria for dedication decisions, and required cumbersome machinery for dedication through a joint resolution. The proposed legislation is intended to supplant the 1973 statute.

The proposed legislation authorizes the Department to maintain the ongoing Natural Heritage Program for inventory, identification, and protection of prime natural areas. A recognition program is designed to encourage the protection of those sites deemed of highest significance. The official "registry" of natural heritage areas permits the owner (private or public) to enter into a non-binding, non-regulatory "gentleman's agreement" to conserve an important natural site.

This legislation establishes a system of nature preserves in public and private ownership. A preserve may be created (1) when the owner places a conservation easement over the site, or (2) when the owner voluntarily dedicates an area as a preserve. By both means, a natural area may remain in private ownership but with guarantees for the protection of the natural qualities. Conservation

easements remove certain development rights that would be incompatible to the natural features. A conservation easement does not allow public access to the private land. Conveyance of an easement may gain the owner charitable donation credits, reduced estate taxes, and deflated development values of the underlying estate for purposes of property tax evaluation. The dedication agreement (articles) would bind the owner (public and private) to preserve the property in its natural condition. This proposal is based upon the good dedication systems already operating in several states. Protection is quite high for a dedicated preserve declared to be in its "highest and best use" as a natural area. Donations of conservation easements and voluntary dedications can be expected because of the advantages to landowners who are sensitive to the natural values of their property.

The Tax Machinery Act already provides for exemption of those natural areas used for scientific and educational purposes. Amendment of the Machinery Act to "classify" private properties dedicated as Heritage Preserves would provide ad valorem tax incentives (see suggested amendment to G.S. 105-275 following the proposed bill).

The costs of the program to establish preserves by voluntary dedication or donations of conservation easements are quite low. This approach is an advantageous alternative to the conventional public purchase of interests in land. Public costs for monitoring natural heritage preserves should be considered as the most economical means to guarantee protection for the benefit of present and future generations.

North Carolina has a strong tradition of citizen-initiated conservation. The proposed Natural Heritage Act builds upon that tradition by encouraging and rewarding the stewardship of our finest natural areas in both public and private ownership.

NATURAL AREAS ADVISORY COMMITTEE -- ACTIONS AND RESOLUTIONS

The DNRCD Natural Areas Advisory Committee is composed of nine knowledgeable botanists, zoologists, ecologists, earth scientists, and conservationists appointed by the Secretary. The purpose of the Natural Areas Advisory Committee (NAAC) is to advise the Department of matters pertaining to the identification, protection, and management of natural areas and preservation of North Carolina's natural diversity. The NAAC, chaired this year by Dr. Albert E. Radford, meets quarterly.

Resolutions and principal actions of the Natural Areas Advisory Committee in this 1977-1978 year were:

NHP-NAAC Affairs

- Reviewed and advised upon proposed guidelines for NAAC organization, functions, and operating procedures (July 1978).
- Endorsed NHP proposal for establishing a statewide network of local contacts (May 1978).
- Advised on the organization of the Natural Heritage Workshop and recommended a series of regional workshops (Feb. 1978).

Policies

- Expressed appreciation to the Secretary for current Departmental pledges of support to the Natural Heritage Program and commitment to natural area conservation interests indicated in the State Comprehensive Outdoor Recreation Plan (July 1978).

Legislation

- Discussed the proposed NC Natural Heritage legislation (May 1978).
- Discussed the proposed Federal Natural Diversity Preservation legislation (Oct. 1977).

Rare and Endangered Species

- Appointed a subcommittee to meet with the Department of Agriculture's Plant Protection Division to discuss efforts for determining the status of ginseng and for designing monitoring, educational, and licensing programs (July 1978).
- Requested that Assistant Secretary promote development of policies and initiatives for plant protection in the division he coordinates (May 1978).
- Reviewed progress of the Wildlife Resources Commission's endangered species program (Oct. 1977-July 1978).

Recommended Preservation of Natural Areas

- Expressed concern to US Forest Service over mining proposals for the Buck Creek oliven barrens area of Nantahala National Forest (May 1978).
- Expressed concern to US Army and Fish and Wildlife Service over natural resources management practices at Fort Bragg (May 1978).

Management of Nature Preserves

- Endorsed staff management plans for Hemlock Bluffs State Natural Area and staff management recommendations for the Catsburg Area of COE Falls Reservoir Project (July 1978).
- Opposed the design of the proposed stairway on the big pinnacle of the Pilot Mountain State Park, concluding that construction permitting unrestricted access to the entire pinnacle area would have unacceptable environmental impacts (July 1978).
- Endorsed South Mountains State Park master plan regarding protection of the bear oak and falls natural areas (May 1978).
- Requested that the Division of Parks and Recreation prepare a general management plan and policy for smaller natural areas (May 1978).
- Approved the Department's Green Swamp management proposal prepared by NHP staff (Feb. 1978).

- Commented favorably on Supt. Goodwin's draft management plan for Weymouth Woods-Sandhills Nature Preserve (Oct. 1977).
- Endorsed the master plan for Pettigrew (Lake Phelps) State Park cypress natural area (Oct. 1977).
- Made recommendations for Cliffs of the Neuse master plan (Oct. 1977).

NETWORK OF LOCAL CONTACTS

The Natural Heritage Program recognizes that its core staff cannot possibly conduct more than a small fraction of the natural diversity and natural areas inventories necessary. The program relies on information provided by other natural scientists and conservationists. To promote this essential flow of information, the NHP has organized a "network" of persons well-acquainted with their local region. This network of local contacts is composed of about 40 scientists and naturalists, including members of the Natural Areas Advisory Committee, who act as local "representatives" for the Natural Heritage Program. They are asked to:

- keep the NHP staff aware of sites in their locality which are noteworthy natural areas and important to the local community
- help the NHP to verify and to update natural diversity information on local natural areas
- relay local "nominations" of noteworthy sites
- inform interested people (including interested students) of the work and mission of the NHP
- assist the NHP staff in informing local civic groups or conservation organizations of purposes and work of the NHP
- help to tap interested volunteers and directing their energies toward specific sites or projects
- help to identify the owners of key sites
- introduce the NHP staff to interested individuals or land owners
- advise the NHP staff on protection strategies for local areas.

In return, the NHP keeps each contact informed of program activities and plans. Each receives a monthly NHP activity report and is provided inventory summaries and priority lists of principal natural areas. NHP staff attempt to meet with the local contacts whenever possible.

A directory to the members of the Natural Heritage network of local contacts follows:

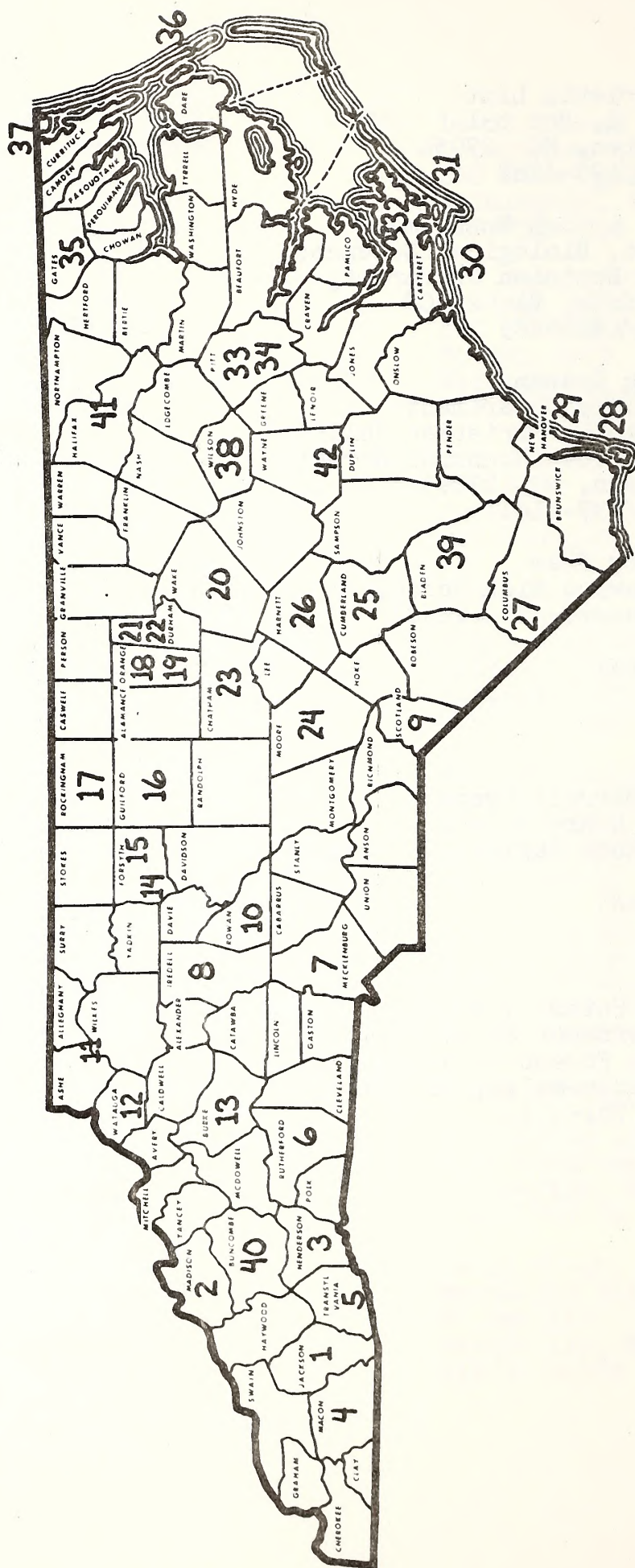
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BUDGET

Federal grants will provide most of the support for the NC Natural Heritage Program through October 1979, by which time a commitment of state funds will be needed. Federal aid to the program is expected to continue but will require state appropriations on a matching basis.

Estimated Expenditures

(Nov. 1, 1977 - Oct. 31, 1978)

	<u>Natural Heritage Program</u>	<u>State Parks Natural Areas Program</u>
Personnel		
Salaries, Wages, Fringe benefits	55,000	38,200+
Travel and subsistence	6,000	2,000
Research Services and other contractual services	3,000	500
Computer	5,000	5,000
Supplies and equipment	850	250
Other costs: postage, reproduction, books, maps, telephones, fees, etc.	10,150	875
SUBTOTAL:	79,000	46,825
TOTAL:	125,825	+partial salary year for environmental specialist

Sources of Funds

(Nov. 1, 1977 - Oct. 31, 1978)

Natural Heritage Program:

Coastal Plains Regional Commission	\$74,000
NC Wildlife Resources Commission	5,000

State Parks Natural Areas Program:

State Appropriations	
Heritage Conservation and Recreation Service	

TOTAL	\$125,825
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ACTION PLAN FOR 1979

To safeguard North Carolina's natural lands and the species they shelter for generations to come, the Natural Heritage Program in association with the state parks natural areas program will:

- * Continue to study, evaluate, refine, and enrich the Heritage data.
- * Develop significance criteria and priority rating procedures for areas critical to the preservation of the state's natural diversity.
- * Establish a state register of natural areas.
- * Seek legislative authorization and formal procedures for dedication of natural preserves.
- * Encourage greater use of conservation easements in protection of natural areas.
- * Utilize the services of The Nature Conservancy and other non-profit land preservation organizations in preserving natural areas.
- * Establish natural area management policies and procedures.
- * Develop management and protection plans for natural areas in the State Parks and Recreation System and assist in developing protection plans for natural areas on other state-owned lands.
- * Provide for regular monitoring of protected areas to ensure that management objectives are met.
- * Assist public and private landowners and managers with good stewardship practices through training workshops and by providing advice and technical assistance.
- * Promote public concern and awareness for their natural heritage. These educational activities will include distribution of media presentations, preparation of magazine and newspaper articles, organization of and participation in workshops and conferences, distribution of program brochures, preparation of a directory of protected natural areas, and other attention to public relations.
- * Encourage university and volunteer participation in the study and protection of critical natural areas.

CONCLUSION

The Natural Heritage Program entering its third year of operation is still a maturing and growing program. Its previous emphasis on compilation of the natural diversity inventory and application of that data for conservation planning will continue. But in the third year, the Natural Heritage Program should shift its emphasis to designate critical natural areas and implement protection plans.

Successful conservation of natural diversity depends on a combination of safeguarding the most important natural areas -- whether as nature preserves or by other means -- and influencing land use policies and practices over wider areas to take account of the needs of wildlife and native plants and of the conservation of other natural features of interest. Executive action, legislation, and financial incentives are essential parts of this approach, but even more important is the acceptance of the needs to conserve and to plan on a wide front and on a long-term basis for the benefit of future generations as well as our own. North Carolinians must now be prepared to plan, and indeed to pay, to maintain their natural heritage. We must recognize North Carolina's flora and fauna and its geological and physiographic features as vital elements in the wealth and heritage of the state.

The success of the North Carolina Natural Heritage Program depends as well upon continued research and inventory work by the scientific, academic and conservationists communities of our state. A great deal remains to be accomplished in order to properly inventory and identify all sites of importance to the conservation of North Carolina's natural heritage. Expanding research must be focused on conservation management. Nature conservation in a state such as North Carolina, where human manipulation has modified practically all the landscape, can never be merely a matter of preservation leaving nature to look after itself. Management is essential and must be based on understanding. Because little attention has been paid in the past to the complex problems of managing plant and animal communities, it is necessary that research programs be initiated to keep pace with the needs of conservation. Sound conservation and management practices must be based on sound scientific research.

The goal of the Natural Heritage Program to protect natural areas is based on the principle that these sites should form a series of areas representative of all the significant ecological systems in North Carolina and, as far as possible, of the range of variation within each. The Natural Heritage Program cannot independently succeed in this action. The conservation of the natural diversity of North Carolina is attainable only through a broad based alliance combining the efforts of public agencies, private organizations, and concerned citizens.

WORKSHOP ON THE NORTH CAROLINA NATURAL HERITAGE PROGRAM

Sponsors: University of North Carolina Environmental Studies Council
North Carolina Academy of Science
North Carolina Botanical Garden
North Carolina Natural Heritage Program (N.C. Department of Natural Resources and Community Development)

Time: March 1, Wednesday, 1978
9 a.m. - 5 p.m.

Place: McKimmon Continuing Education Center
North Carolina State University

Purpose: To enlist increased public and university involvement in the State Natural Heritage Program*

Cost: Registration: Cost covered by Environmental Studies Council
Lunch: McKimmon cafeteria or neighborhood restaurants

Agenda:

8:30 a.m.	Registration
9:00 a.m.	Description of the goals, progress, work activities of the Natural Heritage Program and the need for public and university involvement.
10:00-12:00	Reports on other programs that interrelate with the Natural Heritage Program. (a) Natural History Museum (b) Wildlife Resources Commission endangered species program (c) N.C. Botanical Garden (d) Highlands Biological Station (e) Coastal Resources Commission (f) N.C. Nature Conservancy (g) State Parks and Preserve System
12:00-1:00	Lunch
1:00 p.m.	How can you help safeguard the State's natural heritage? The afternoon sessions will focus on the need for university and public assistance in the inventory of natural areas and the protection and management of natural areas.
1:30-3:30 p.m.	Round-table discussion sessions based on specific interests and problem areas.
3:30-5:00 p.m.	Summation of group discussions, further discussion of public and university involvement in the Natural Heritage Program, and recommendations to the Natural Heritage staff.

*The North Carolina Natural Heritage Program is responsible for identifying and protecting areas which best represent the State's natural heritage.

I. Natural Diversity/Natural Areas Inventory and Research

- a. What information does the State Natural Heritage Program have which would be useful to university needs?
- b. How can universities help meet the State's needs for natural areas inventory and research?
- c. How can public agencies support university studies that are of mutual benefit?
- d. Where do we find the money to support such studies?
- e. How can we connect expertise with need?
- f. How can citizen conservationists contribute to the identification and inventory of natural areas?

II. Endangered and Rare Species Protection

- a. Are our species preservation programs on the right track?
- b. Can we improve our methods to determine species rarity and endangerment?
- c. Can we improve our methods to determine "critical habitats"?
- d. How do we extend species preservation efforts to include native plants?
- e. What are universities doing to protect (or to endanger) rare species?
- f. How can we increase legal protection of commercially exploited species?
- g. Is there a role for citizen conservationists in efforts to protect rare species?

III. Natural Areas Protection and Management

- a. Where do we go from here to protect more natural areas?
- b. How can public policies toward natural areas be improved?
- c. Are "protected" natural areas being properly managed?
- d. Is the general public concerned with protection of the natural environment?
- e. How can citizen conservationists (individually and collectively) contribute to protection of natural areas?
- f. How can the private landowner be encouraged to preserve natural areas?
- g. How can colleges and universities contribute to improved protection and management of natural areas?

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**This Issue's Cover**

Cover design by Don Meserve. The illustrations show some of the areas that must be considered in Land Use Policy today. The solar house is courtesy of Integrated Energy Systems, Chapel Hill, North Carolina.

Planning for Natural Diversity: The N.C. Natural Heritage Program

For conservationists in North Carolina, it is an exciting time. In recent months, a four million dollar purchase of Currituck Banks sanctuaries has been made possible by the largest conservation gift in the history of American foundations. The preservation of the Green Swamp national natural landmark has been achieved through one of the largest land donations by an American corporation. Fund raising and negotiations are in progress to acquire more of North Carolina's finest natural areas. A

strong conservation spirit is gaining force. Conservation in North Carolina is scoring victories through an unusual alliance of environmentalists, business, universities, foundations, and government. Many of the current achievements are spawned by the creation of two young and parallel efforts: the North Carolina Nature Conservancy and the North Carolina Natural Heritage Program.

North Carolina is blessed by a magnificent natural diversity. But it is

threatened. Habitats of rare and endangered plants or animals, undisturbed ecosystems, and other areas of special ecological interest are of great concern. These resources are important for their scientific, educational, recreational, ecological, economic, cultural, and inspirational values.

Natural diversity is commonly the loser in our society's quest for prosperity and urbanization of the land. North Carolina's natural heritage, while still rich, is a pale remnant of the past. Each year a bit more of the natural landscape disappears to development. Our wildlife, particularly the native non-game species, is pushed back into ever more isolated enclaves. State scientists and

resource managers list several hundred native plant and animal species whose survival is endangered or threatened. Prime instances of forest and other ecological associations are reduced to the point of being artifacts of the original landscape.

Few public decision-makers, including planners, understand the importance of conserving natural diversity. Fewer still recognize that existing parks, refuges, and publicly-owned natural areas preserve no more than a fragment of our natural heritage. Local land use plans, likely as not, propose future development of the critical natural areas that remain in private ownership. Management plans for lands in public ownership too frequently are destructive of vulnerable ecological resources.

The North Carolina Natural Heritage Program is designed to inventory the state's critical elements of natural diversity and to identify those natural areas most deserving protection. Established in late 1976 with assistance of the Nature Conservancy and private foundation grants, the Natural Heritage Program is a unit of the Division of Parks and Recreation within the State's Department of Natural Resources and Community Development. Its inventory involves collection of data on the occurrences, location, rarity, ownership, protection and management status, and site qualities for the State's most critical elements of natural diversity—habitats of endangered and rare species, mature and high-quality examples of plant communities, unique geologic features, and important wildlife habitats.

Our approach recognizes that a rational decision process must determine which parts of the natural landscape most merit preservation and which sites most warrant investment of limited financial resources. The inventory produces an index of relative rarity showing which natural elements have fewest occurrences and which are least protected. Direct comparisons of quality, viability, and defensibility can be made on the basis of real data, as opposed to the subjective judgments that too often prevailed in the past. Analysis of the data and follow-up field surveys permit us to determine the sites that most merit preservation. After identifying the best prospects, we can make a detailed investigation and develop a preserve proposal, protection strategies, and management plans.

Natural heritage programs have been established at the request of ten state governments by the Nature Conservancy, a national citizen-based conservation organization. The Nature Conservancy has developed a system for

these states to conduct the ecological inventory, to manage and analyze assembled data, and to implement protection strategies. As the programs are incorporated within state agencies, the system continues to accumulate inventory information, to refine protection priorities, to promote public concern for conservation, and to preserve ecologically significant areas.

The Nature Conservancy has helped preserve over a million acres of natural lands in the United States, including over 85,000 acres acquired in North Carolina. The Nature Conservancy in North Carolina has acquired land for the protection of such varied areas as Great Dismal Swamp, Jockey's Ridge, Roan Mountain, Chowan Swamp, Eno River, Stone Mountain, Green Swamp, Bird Shoal Islands, and Currituck Banks. The North Carolina Nature Conservancy, a branch of the national Nature Conservancy, is directed by trustees and advisors composed of leading businessmen, conservationists, financiers, lawyers, scientists, and politicians. Its preservation projects, many of which are in progress, are based upon priorities set by the Natural Heritage Program. Its purchases are sometimes in cooperation with public agencies and sometimes private actions. Working with public agencies, universities, and other conservation groups, the Conservancy offers North Carolinians the opportunity to contribute to the protection of the state's natural diversity.

The value of the Conservancy's assistance in establishing natural heritage programs within state governments, rather than within the private or academic sectors, is that states can potentially bring tremendous protection capabilities to bear. Also, as units of government, the programs provide for effective interaction and cooperation among public agencies, and permit the long-term maintenance of an ecological information system that public agencies can best afford. In a state where land conservation traditionally has been promoted by private citizens, a cooperative effort between government and the private sector offers the greatest possibility of success.

The Natural Heritage Program has developed a sophisticated yet economical data management system that provides an information and planning tool for use in decision-making. Information on all occurrences of critical natural features are recorded in USGS topographical maps, computer storage and retrieval bank, and cross-referenced manual files.

The endangerment of our natural heritage is largely unnecessary since

there are nearly always alternatives to destruction, but only if decision-makers are well-informed. In the past, there has been a lack of (1) sufficiently detailed environmental information focused on natural elements, (2) adequate methods for evaluating this information and setting sound protection priorities, and (3) a balanced and practical system for efficiently and effectively protecting the recognized critical areas. There has been a lack of organized, coordinated, and accessible information on the existence, location, condition, and protection status of elements of natural diversity. The Natural Heritage Program meets these needs.

The Natural Heritage Program can help assure effective allocation of resources, while avoiding development conflicts. Our information is made available freely for the use of other public agencies, public works planners, local governments, scientific research, educational, and conservation programs. We believe that by providing natural diversity data to others, we contribute to improved management of natural areas in public ownership, environmental impact assessment, and development planning. The timely input of ecological information in decision processes will serve to avoid unnecessary natural resource conflicts or destruction of significant natural elements.

Public conservation agencies use our data for their resource inventories and planning. The U.S. Forest Service uses our data for its North Carolina forest inventories and unit planning. The Fish and Wildlife Service uses our information for establishing priorities for protection and acquisition of wildlife habitats in North Carolina. We have provided natural diversity information to the National Park Service for developing management plans over the Great Smoky Mountains and Cape Hatteras national parks and for assessing potential national natural landmarks. Our program provides data management for the NC Wildlife Resource Commission's endangered species protection program. We contribute to the Coastal Resources Commission's determination of coastal areas of environmental concern. In which development is regulated. We aid the Division of Environmental Management in identifying natural areas in its water basin development plans. We contribute to the information services of the Land Policy Council. The Division of Parks and Recreation incorporates natural diversity data in its park master plans, environmental assessments, and state outdoor recreation plan.

Heritage information is also used by local governments for resource inven-

tories and land planning. The Piedmont Triad Council of Governments wrote that:

The PTCOG views the N.C. Natural Heritage Program as an irreplaceable organization in compiling and distributing this information from one central location. Most councils of governments and local governments have neither the money nor the expertise to perform this work. Without the Heritage Program, we fear development will unknowingly deface or destroy some of the natural beauty and uniqueness of North Carolina.

The Natural Heritage Program participates in environmental impact assessment reviews of proposed development projects and also provides natural diversity data to development agencies for project planning. This service adds a new dimension to the State's review capabilities and is appreciated by the development agencies.

We have a better prospect for protecting our rich habitats of native species and remnants of the original natural landscape as a result of the inventory and protection planning program. The Natural Heritage Program has demonstrated its effectiveness for con-

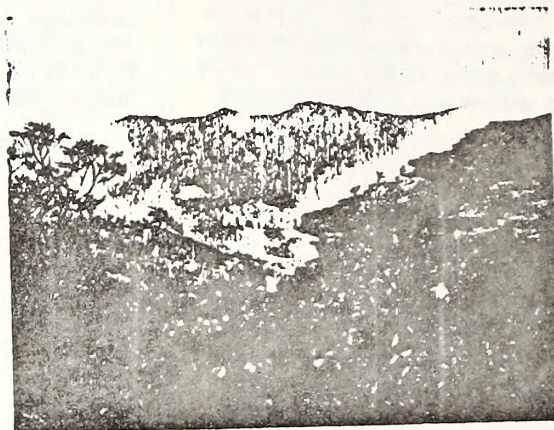
tributing ecological data to a range of decisions and for identifying the State's most significant natural areas. The Nature Conservancy has focused public efforts to protect those areas. Our natural heritage can now potentially be protected through cooperation of government, private organizations, and concerned citizens.

*Charles E. Roe
Coordinator
N. C. Natural Heritage Program
N. C. Department of Natural Resources
and Community Development
Raleigh, North Carolina*

On the Strength of the Evidence



Currituck Outer Banks



Bluff Mountain



Pitcher plant, Green Swamp

The Conservancy's Natural Heritage Program demonstrates its effectiveness in North Carolina

by Charles E. Roe and Joy S. Davis

At an early morning press conference last summer in Raleigh, North Carolina, Governor James B. Hunt made two announcements that became headlines. Governor Hunt revealed the 13,850-acre gift of the Green Swamp to The Nature Conservancy, noting that it was the first natural area to be identified and recommended for protection by the North Carolina Natural Heritage Program. Then, the Governor affirmed his support of the Heritage Program and endorsed its continuance under state administration. The Secretary of Natural Resources and Community Development pledged that funds would be made available to maintain a program which had demonstrated its practical value.

Undoubtedly, the fact that the Heritage Program had played a key role in the acquisition of one of the finest natural areas in the state served as a catalyst to the state officials whose job is to carefully balance cost and results of the programs funded by taxpayers' dollars. By forging a cooperative link between the state and the private conservation sector, the Heritage Program helped assure the protection of a natural area in which a myriad of rare and unusual plants flourish. An aerial view of parts of Green Swamp shows a checkerboard of green and gold, with yellow pitcher plants growing in abundance amid other lush vegetation. Within the shaded depths of the swamp, inquisitive children on nature tours hope

to observe the hinged leaves of the Venus' fly trap closing on its tiny prey.

What a visitor to the swamp can convey to others—sheer delight at nature's bountiful variety and the wondrous adaptability of species for survival—is painstakingly recorded for the Heritage Program data base. The sight of an endangered red-cockaded woodpecker in the wild must be translated into a documented presence on a data form. Without such data to convey these pictures to the decision-makers, protection of critical species habitats and exemplary ecosystems could not be assured.

In North Carolina, the academic and conservation communities were especially enthusiastic about lending their support and knowledge to the Heritage inventory when the program began. The considerable information that had already been collected was rapidly but systematically entered into the Heritage data base, and North Carolina got a head start on its inventory. After one year, the Conservancy made North Carolina a model state for implementing Heritage Program information, and a field director was placed in the state to coordinate protection action.

Not many demonstrations of the effectiveness of the Heritage Programs are as dramatic and well publicized as the protection of a vast natural area. In fact, the efficiency of the Heritage process is akin to the traditional approach of the Conservancy: quiet, but effective. The Natural Heritage inventory is a useful day-to-day planning tool, for enlightened decisions cannot be made without sufficiently detailed information focused on the critical elements of natural diversity. With organized, coordinated, and accessible information, the Heritage Program answers many needs in North Carolina. Information is made available freely for use by public agencies, public works planners, local governments, scientific research, educational and conservation programs.

By providing natural diversity data to others, the North Carolina Natural Heritage Program contributes to improved management of the state's natural areas in public ownership. The National Park Service has used Heritage information for developing management plans for the Great Smoky Mountains and Cape Hatteras National Parks, which will be beneficial in preserving the unique character of public lands already set aside. The act of acquisition is just the first step in assuring the protection of a vital natural area. The Park Service also uses Heritage data to assess candidates for National Natural Landmark status.

Public conservation agencies are interested in learning the locations and relative rarity of natural elements for their resource inventories and plan-

ning, and the information they need is readily available from the Heritage Program. The Forest Service uses element occurrence data for federal and state endangered plant species found in national forest lands to design forest management plans. The Fish and Wildlife Service makes use of Heritage information to establish priorities for protection of wildlife habitats in the state.

The North Carolina Wildlife Resource Commission is administering an endangered species protection program, and relies on the Heritage data system for information on specific populations of federally endangered species. Also, the program contributes data to the Coastal Resources Commission, which determines coastal areas that are of environmental concern and regulates development of coastal zones. The Division of Environmental Management consults the Heritage Program's priorities for protection to help identify natural areas in the state's water basin development plans. The Land Policy Council and the Division of Parks and Recreation are also users of Heritage data, the latter incorporating relevant information into its park master plans, environmental assessments, and state outdoor recreation plan.

The Heritage Program has filled a void, for it is the first comprehensive source of information about exemplary ecosystems and critical species habitats. In fact, there is such a demand for information that, as in the case of any urgently-needed service, one wonders how users' needs were met before. Although much research had been conducted in the state, the information was piecemeal, and data on some specific areas or species either could not be readily obtained from one source or did not exist.

Local governments use Heritage information for resource inventories and land planning, and officials have voiced their appreciation of the capabilities of the centralized data bank. The Piedmont Triad Council of Governments, which has used data for regional land use and open space plans, pointed out that, "Most councils of governments and local governments have neither the money nor the expertise to perform this work. Without the Heritage Program, we fear development will unknowingly deface or destroy the natural beauty and uniqueness of North Carolina."

The agencies that have benefited from the inventory, through their participation in state environmental impact assessment reviews of proposed projects and their assistance to development-planning agencies, appreciate the new dimension the Natural Heritage Program has added to the state's review capabilities. A Corps of Engineers District Engineer wrote, "When the District finds itself in need of information on natural areas or on the loca-

tions of various rare species of plants or animals, the personnel at the Heritage Program have responded quickly and effectively in supplying our needs. . . . The existence of a natural resource data base that is both comprehensive and up-to-date is of immense value to an agency involved in making decisions affecting the future and quality of our natural resources."

A chief scientist with the Carolina Power and Light Company, noting that regulatory guidelines require identifying endangered and threatened flora and fauna prior to construction of power plant sites, concurred—"The program is an invaluable source of information."

The Natural Heritage Program makes possible a more objective evaluation of lands and ecological resources, so that the most important natural areas may be recognized. The inventory produces an index of relative rarity showing which elements have few occurrences and which are least protected. Analysis of the data base and follow-up field surveys permit the staff to delineate sites and determine priorities. The product is a list of the best possible sites that can adequately preserve North Carolina's natural diversity. Boundary lines may be established for a proposed preserve to include a diversity of elements and to provide for the greatest viability, defensibility, manageability, interdependency, and utility. The program weighs such factors as ownership, existing threats, and feasibility for protection before acting to establish a preserve. After identifying the best preserve pros-

pects, an intense investigation is made to develop protection strategies and management plans.

The Natural Heritage Program has identified another site—Bluff Mountain—which promises to be one of the most ecologically significant natural areas in the state ever to be brought to public attention. The Conservancy has obtained an option to purchase Bluff Mountain, a botanical jewel in Ashe County harboring a stunning concentration of occurrences of critical elements. The federally endangered spreading avens, a kind of rose, is found there, along with two state endangered native plants—wretched sedge and Carolina saxifrage. Of the four state threatened plants in the area, two are endemic—Gray's lily and Carey saxifrage. In addition, Bluff Mountain supports 22 peripheral species, 16 of which are state endangered and 6 of which are listed as threatened in North Carolina. All together, occurrences of 27 critical elements will be protected by preserving Bluff Mountain as a natural area.

Most of these rare species are found in the mountain bog, or fen, on the plateau. From the high cliffs that rise above a cove, there is a scenic panorama of the Southern Appalachians. The vegetation is a unique mix of northern boreal species and bog plants with mid-Atlantic coastal characteristics. The diversity of Bluff Mountain, with its outstanding botanical elements, makes it a prime natural area for protection.

Several other natural areas designated as worthwhile by the Natural Heritage Program have become projects of the Conservancy in recent months. Some 200 acres of woodlands in the Sandhills known as the Boyd Estate encompass the largest known stand of old-growth longleaf pine trees in North Carolina. The trees provide habitat for the federally endangered red-cockaded woodpecker. Though struggling for survival, the birds continue to decline in population, as there may be six to eight birds in a colony, but never more than one breeding pair per colony. The other birds in the colony help care for the two or three nestlings. The Friends of Weymouth, a Conservancy project committee, is fund raising to protect the area. The unique woodlands and the endangered birds they shelter will become part of the adjacent Weymouth Woods Nature Preserve, owned and managed by the state.

In a landmark cooperative project of the Conservancy and a private foundation, two tracts of land on the Currituck Outer Banks in North Carolina have been protected. The Natural Heritage Program noted the strategic importance of the Monkey and Swan Island tracts. By acquiring the two areas, preservation of the ecological diversity of the marshes on Currituck Sound can be assured.



Gray's lily, threatened in North Carolina, is one of 27 critical elements identified at Bluff Mountain by the Heritage Program.



Carrot Island, once purchased by a developer and scheduled for subdivision, is now preserved for this and future generations.

The Richard King Mellon Foundation of Pittsburgh granted \$4 million to purchase these fine undisturbed tracts, located about 20 miles south of the North Carolina-Virginia border.

Researchers indicate that the marshes of Currituck Sound are the most important unprotected wetlands on the Atlantic coast. They provide habitat for 15 percent of the waterfowl on the Atlantic flyway. Approximately 170,000 waterfowl use the marshes each winter, including mallard, black duck, widgeon, gadwall, canvasback, ringnecked ducks, greater snow and Canada geese. Over 100 bird species have been recorded in the area, including the Southern bald eagle and osprey. The migrating route of the endangered peregrine falcon follows the Outer Banks.

Farther down the Atlantic shoreline, off the coast of Beaufort, lies Carrot Island, a special wildlife habitat noted by the Heritage Program. Carrot Island and the adjacent Bird Shoal are a combination of unspoiled marshes and dense woods that show little human disturbance. Shorebirds and waterfowl on the Atlantic flyway breed and nest on the island and the shoal, and marine life abounds in the shallow waters. Well-known author and conservationist Rachel Carson spent a summer in Beaufort and found inspiration for *The Edge of the Sea* while exploring the rich tidal lands of the area. She brought to life the wealth of diversity of Bird Shoal in her book, which blended scienti-

fic expertise and lyric prose to "interpret the shore in terms of that essential unity that binds life to the earth."

Preserving the essential unity of the birds, marine life, and diverse plant communities is the object of a fund-raising drive launched by the Conservancy and Duke University for the purchase of Carrot Island and Bird Shoal. The Duke University Marine Laboratory, one of six research institutions that rely on the unspoiled marine ecosystem for research and education, will receive the property, and the coastal residents of Beaufort will see a beloved natural area remain untouched by development.

The North Carolina Natural Heritage Program has demonstrated its importance and usefulness by contributing ecological data to a range of decision-makers and by pinpointing the state's most select natural areas. The overall success of the State Natural Heritage Programs substantiates the wisdom of The Nature Conservancy's concept. We have a far brighter prospect for protecting habitats of native species and remnants of the original natural landscape as a result of the Heritage Programs, and it is gratifying to see them in action.

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